Understanding the Full-Requirements Supply Product

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Objectives of Presentation

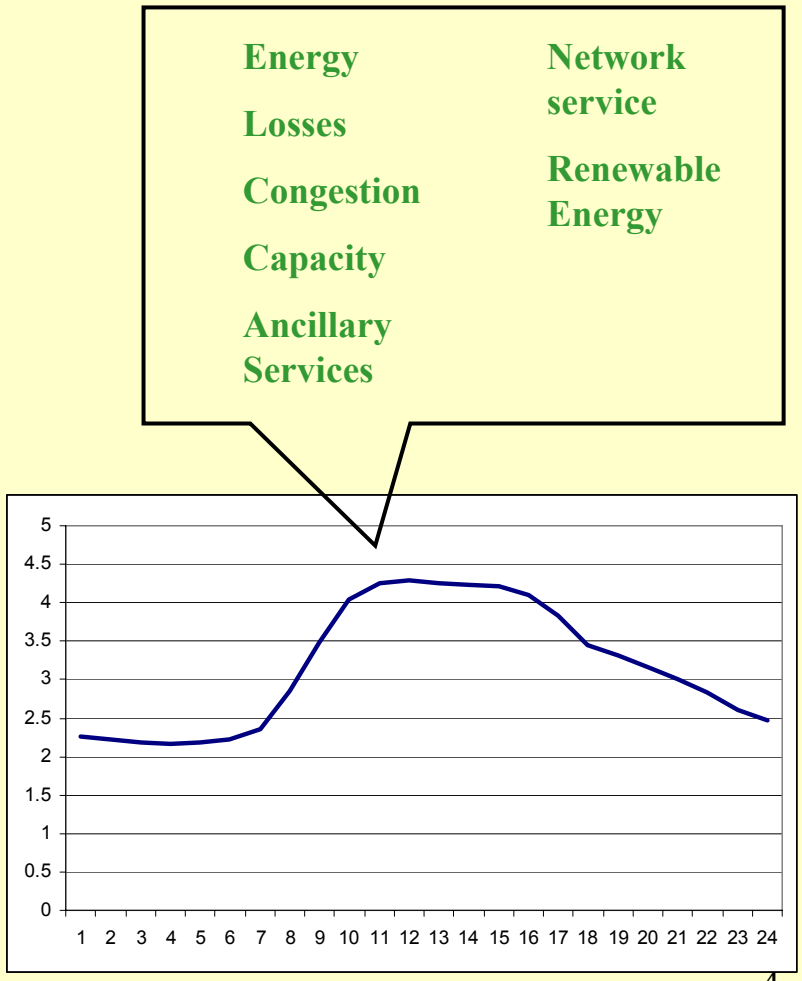
- To provide understanding (not valuation approaches) of the components of the full-requirements product
- To provide background for the auction presentations

Full-Requirements Isn't New

- Utilities have been pricing the full-requirements product for decades through the retail rates
- While the products are nearly identical, the context has changed
  - Market basis brings ability to use risk management tools

Customer Gets Same Product

- Full-requirements supply contract requires supplier to assume risks inherent in utility's obligation – i.e., the physical product has to be identical to what the customer receives from the utility



Assembling a Supply Portfolio

- Auctions draw a variety of market intermediaries: generators, marketers, financial entities. An auction participant can:
  - Purchase load-following energy from generator or marketer, who will then manage associated risks, OR
  - Build up portfolio on its own (combination of physical and financial products) and self-manage associated risks
- Full Requirements Product (FRP) is "vertical" share of total mass market load – fixed % of total electric demand for those rate classes

Cost Components of the Product

- Underlying energy, congestion, transmission losses, capacity (including required reserve), ancillary services, network service, customer migration, renewable energy
  - Energy adjusted for expected and unexpected customer usage

Other Costs Are Function of Auction Design

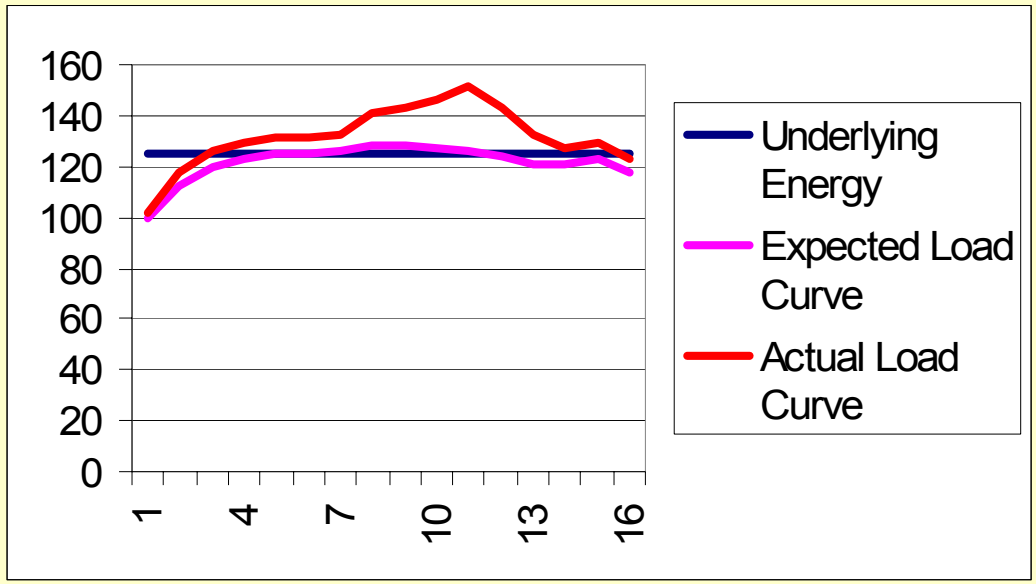
- Appropriate auction design and regulatory oversight would avoid inclusion of other costs components in clearing price, for example regulatory risk

Underlying Energy

- FRP pricing begins with forward prices for baseload energy (100% load factor) a/k/a underlying
  - Quotes available in visible over the counter (OTC) market
  - Forward price is expected future spot price
  - Visible market means bids/offers that are active or just traded in the market
    - Confidence in bids/offers directly proportional to depth and volume of transacted products
  - Energy transacts in time buckets: 5 x 16, 2 x 16, 7 x 8

Adjustments to 100% Load Factor Products

- Customer usage reflects expected deviations from constant delivery (i.e., same quantity in each hour)
- Customer usage also reflects unexpected deviations (weather, customer behavior, etc.)



Congestion, or Basis

- Most forward products transact at a trading hub – e.g., Western Hub, NiHUB
  - Scheduling the energy for load may entail congestion risk:
    - The difference between the value of energy at the hub and the value at the load zone
- Also need to consider transmission losses from the hub to the load

Reconciliation Risk

- Difference between scheduled energy and metered energy
- Difference typically smoothed over all hours of month

Load Curves

- Historical hourly load and price used as starting point to quantify risks
- Actual load and price shows:
  - Volumes by time bucket
  - Load factors by period or time bucket
  - Usage and price under different conditions
  - Price-load correlations

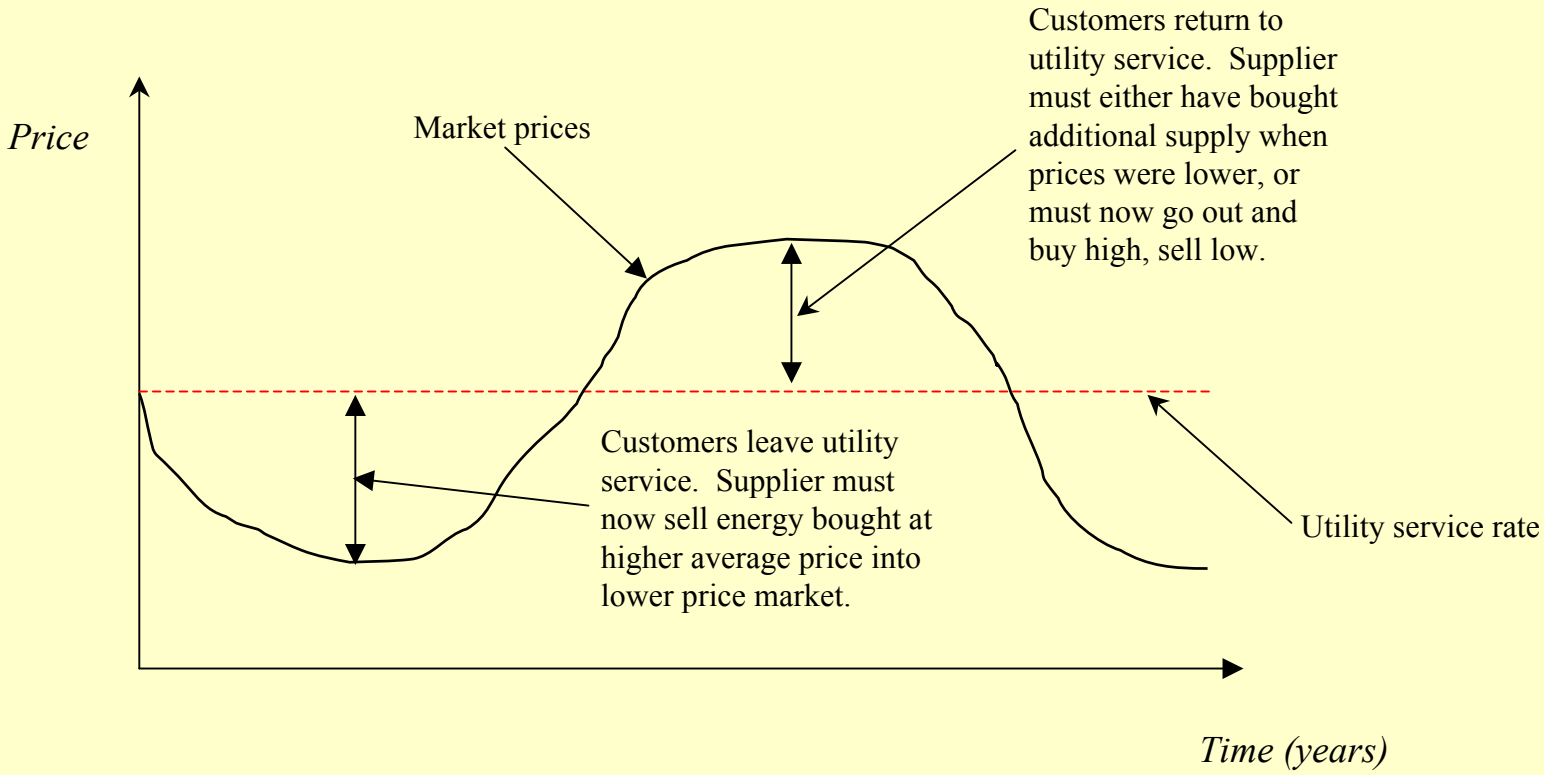
Capacity

- Cost of planning reserves (including required reserve) based on customers' expected peak demand
- Direct approach to reliability planning

Customer Migration

- Movement of customers to and from standard offer load at their discretion, pursuant to utility switching rules
  - Standard offer rate caps customer risk
- Supplier risk: getting long in low-value market, or short in a high-value market

Customer Migration Illustration



Ancillary Services

- Transmission-related expenses
  - Regulation, spinning reserve, other services necessary to support transmission of capacity and energy from resources to loads
  - Charged to network service customers

Network Service

- Reservation of firm transmission over high-voltage system to network loads, based on customer contribution to transmission system peak

Renewable Energy Credits

- Financial assurances that purchases being made from generators that use renewable fuels

Regulatory Risk

- If participants believe significant chance results could be rejected, or that supply contract could be terminated by regulator during supply period, risk will be priced into the deal
- Mitigation:
  - Regulatory approval of process up front critical to allow efficient, prompt approval of results
  - Scope of approval focused on appropriate factors (was auction conducted according to established rules?)
  - Assurance that supply contract will be honored throughout delivery term